

call.³⁴ The hardware costs of the network can be measured, but appear to be a small part of the total cost. Access charges are the single largest component of cost and are easy to measure. The remaining 5 cents or so of cost are in areas such as customer service, billing, and other office-based activities that are hard to measure on a marginal basis. Even Dr. Crandall and Professor Waverman, in their discussion of the benefits of Ameritech entry into long distance, consider the costs per minute for marketing, customer service, and overhead.³⁵ But Professor MacAvoy does not.

139. One approach to measuring cost is to look at the very best prices charged for different long-distance services. Long-distance transport sells for about 1.5 cents per minute, which is in line with estimates of network costs. It appears that the best available price for switched long-distance for offices or homes is a little below 10 cents per incremental minute, about 4 cents above access charges.

140. Despite the difficulties in measuring marginal cost accurately, I believe that the price-cost margin has declined substantially in the long-distance industry in the past decade. This decline is consistent with increasing competition. The decline has reached the point that the industry today is not far from the limit where price just covers marginal cost.

F. Cost Differentials among Customers and Corresponding Price Differentials

141. It is well known that customers with higher volumes pay less per minute for long-distance service. Some economists have been concerned that these price differences arise from the type of price discrimination that occurs when sellers have market power. Alternatively, the price differences could reflect cost differences. Pure price discrimination, not based on cost differentials, will not exist in a textbook perfectly competitive market. Price differences based on cost differences will occur even in perfect competition. In the long-distance industry, there is good evidence that favorable prices promoted mainly to high-volume customers (a common form of price

³⁴ *MacAvoy Affidavit*, p. 27.

³⁵ *Crandall and Waverman Affidavit*, p. 52.

differential in the industry) are the result of cost differences rather than pure price discrimination.

142. The costs that a long-distance carrier incurs to serve an additional customer for an additional month are substantial. A major component is the cost of billing. According to MCI, the cost of billing a customer with a single long-distance call is about \$.48 per month (based on MCI's contracts with local carriers). Another major component of the cost during the period under study of an additional customer is the charge for the Universal Service Fund. This charge is about \$.50 per line per month. Thus, an additional customer costs about \$.98 per month.

143. As I have noted earlier, there has recently been a shift toward simplified flat-rate long-distance plans and away from explicit quantity discounts, though some flat-rate plans have minimum charges. Higher-usage customers are more likely to take the trouble to seek out the best flat-rate plans. Long-distance carriers are likely to target known large users for their flat-rate promotions, because it is not worth the effort of contacting the low-usage customer.

144. If the higher rates per minute paid by the smallest customers are the result of pure price discrimination and do not reflect differences in costs, including the promotional costs of signing up the customers, then there would be an important arbitrage opportunity for resellers. Because a reseller can buy service cheaply at high-volume low prices and resell the services at higher prices to small customers, the reseller makes substantial profits when prices depart from costs. As I have discussed, there is an active market for resold service—there are at least 260 resellers of long-distance service. I find it unlikely that there are large profits available to resellers that they have failed to pursue, despite the vitality of the reselling business. A more reasonable explanation is that there is an additional cost to recruit and serve each customer. As a result, carriers offer low prices to large customers, as would be expected under competition, to reflect the recruiting cost and the fixed monthly cost of serving a customer.

G. Technical Improvements and New Services since Divestiture

145. Even the occasional user of long distance in the United States is aware of the tremendous improvement in the quality of service in the past decade. Background noise, cross-talk, echoes, and dropped calls have essentially disappeared from long-distance calls. The usefulness of one minute of telephone conversation has risen over the period at the same time that the cost of that minute has fallen dramatically. Fiber optics account for much of the improvement. State of the art fiber network has advanced from under a billion bits per second in 1986 (capacity for 10,000 simultaneous phone calls) to 1.76 billion bits per second in synchronous optical networks today. In addition, the new dispersion-shifted fiber technology requires half as many regenerators per mile in the network. These advances in long-distance technology have lowered costs and improved reliability. The carriers that took advantage of the opportunities in long distance as the AT&T monopoly was broken up—MCI chief among them—have been leaders in advanced fiber technology.

H. Structure and Competition

146. The data reviewed earlier in this section effectively demonstrate the benefits that consumers have received from the development of a competitive long-distance market. In addition, the structural factors often considered by economists in judging the likelihood of the existence and continuation of competition support the conclusion that vigorous competition is serving the interests of the long-distance consumer. These factors include the concentration of sellers, trends in market shares, the ability of rivals to observe prices, barriers to entry, profitability, and returns to scale.

1. Concentration

147. The domestic long-distance industry in the United States has the following competitive structure: There are four carriers with national networks (AT&T, MCI, Sprint, and WorldCom). Their current market shares

are roughly 54 percent, 18 percent, 9 percent, and 5 percent, respectively.³⁶ There are at least 20 other carriers with annual revenues over \$100 million, including Cable & Wireless and Allnet. In addition, numerous other carriers have smaller roles in the industry, based on their own facilities, capacity leased from other owners, and on reselling network services from other carriers. The FCC reports that there are 390 firms identifying themselves as long-distance carriers or resellers of interstate services.³⁷ The sellers other than the top four now account for 15 percent of the market.

148. AT&T's market share of just over half does not necessarily indicate a serious deficiency in competition. In any industry, but particularly in an industry where one seller has had an historical head start, one must examine a broader set of information than market share to reach conclusions about the state of competition in a market. In particular, such an examination should consider trends in market shares, barriers to entry, and the prospective profits of a new entrant. It should also consider direct evidence on price-cost margins, as I discussed earlier.

149. WorldCom is now the fourth largest long-distance carrier with nearly 4.1 million customers as of 1995. It has grown both by building its own facilities and by acquisition of other carriers. In January 1995 WorldCom's predecessor, LDDS, acquired WilTel, the sixth largest carrier. Currently, WorldCom has about a 5 percent share of the long-distance market. Allnet is the fifth largest carrier with 1.5 million customers as of 1995. Allnet has achieved its growth as a reseller. In 1995 Frontier Communications acquired Allnet's parent. Their combined market share is about two percent of the market. These two firms are just two of the many players who are aggressively challenging AT&T, MCI, and Sprint. At present, there are 130 facilities-based long-distance carriers and 260 resellers who are actively recruiting customers.

150. The market contains many aggressive, successful carriers who have every intention of taking as much business as they can away from the

³⁶*Long Distance Market Share, Second Quarter 1996*, Table 6, Quarterly Toll Revenues Reported to Shareholders, Industrial Analysis Division, Common Carrier Bureau, Federal Communications Commission, September 1996.

³⁷ *Ibid.*, Table 1.

larger carriers. Executives in the industry who are constantly fighting to retain customers solicited by WorldCom, Allnet, and other aggressive sellers would be amused at a portrayal of their industry as a comfortable club with just three members who have agreed not to poach on each other's territories. These other carriers could expand rapidly if competition among the larger carriers were inadequate and left prices above competitive levels. Further, the smaller carriers are increasing competition in the market through consolidations that result in a number of highly successful entities such as Frontier Communications, the fifth-largest carrier. A recent example is the merger announced on June 6, 1997, between Excel and Telco Communications Group, Inc., to create what will be the sixth-largest carrier.

151. The smaller carriers thrive on the availability of fiber capacity in the lease market. Several carriers, such as WorldCom, have an important business in building and leasing fiber capacity to other long-distance carriers. Lease customers include the major carriers as well as the smaller interexchange carriers.

152. Aggressive rivalry from the other larger carriers—MCI, Sprint, and WorldCom—together with the presence of numerous smaller carriers now accounting for 15 percent of the market has been effective in promoting competition in the long-distance market even though AT&T remains the largest long-distance carrier.

2. Trends in Market Shares

153. The changes in and current levels of market share of the long-distance carriers reveal a vigorously competitive market. Thirteen years have passed since divestiture opened the long-distance market. AT&T still has a majority share, but it continues to lose share—from 65 percent in 1990 to 53 percent in 1995—to all of its rivals. What market share AT&T still has, it retained only by competitive response to the aggressive attempts of its rivals to lure away its business. MCI and Sprint, through combative pricing and pursuit of customers, have raised their combined market shares, to 28 percent as of 1995, up from 24 percent in 1990. The rise in MCI's and Sprint's market shares accounts for about a third of AT&T's loss of share. The remainder—two-thirds—of AT&T's loss was the gain of smaller, but fast-growing and successful, carriers.

154. Measured by economists' favored index of market concentration, the Herfindahl-Hirschman Index (HHI), long-distance service has become ever more competitive with the passage of time. The HHI for 1996 was at a level only half of what it was in 1987. With a continuation of the downward trend observed continuously since divestiture, the long-distance industry will enter the range of a relatively unconcentrated industry within the next 10 years or so.

155. One way that the smaller players are increasing competition in the long-distance market is through consolidation. Consolidation among the smaller carriers has resulted in a smaller number of more successful entities, such as WorldCom, which has made about 12 acquisitions in the last five years. WorldCom's revenues are projected to continue to grow at about 20 percent for next year.³⁸ Another carrier, Allnet Communications Services, specializes in long-distance services for small and medium-sized businesses. Allnet offers nationwide service over leased transmission facilities that are all digital. It is profitable on revenue of about \$827 million.

3. Communication of Prices to Rivals

156. Economic analysis of the relation between competition and rivals' observation of price has stressed that the central question is whether a firm can take its rivals by surprise by offering terms to prospective customers that the rivals cannot match immediately. If a smaller firm can attract a significant number of customers before its rivals respond, competition is enhanced because the firm can expand relative to its larger rival or rivals. Even a one-day advantage can be crucial—in the airline business, one carrier can run a media blitz for a special low-price offer for a single day and book a large amount of business, even if the other carriers respond with their own blitzes the next day. In the residential long-distance business, one important tool is the signup bonus. The larger carriers target their rivals periodically with mass mailings offering bonuses—the rivals learn about the tactic only after it occurs. Promotional bargain offerings come at such a fast and furious pace that rivals cannot respond quickly

³⁸ *Telecom Services - Long Distance*, Table 5.

enough to erase the temporary advantage that each offer provides to the carrier making the offer.

157. The observability of prices by rivals is a significant issue in markets with high barriers to entry and small numbers of firms. But in the long-distance market, with hundreds of sellers, a smaller seller need not fear that its larger rivals will respond to the prices it sets. The small firm can publicize its prices as widely as it chooses. Smaller firms find viable niches in the market, knowing that larger rivals would sacrifice too much profit from their existing customers if they matched the terms that were being offered by the smaller firms to a few of its customers. The combined effect of the hundred or so smaller carriers, each nibbling at the shares of the larger carriers, is to enforce a high level of competition in the market in general.

4. Barriers to Entry

158. Although market share information is useful, it is important to examine a broader set of information than just market shares to reach conclusions about the state of competition in a market. In particular, the examination should consider barriers to entry and the prospective profits of a new entrant. In a non-competitive industry with conspicuous barriers to entry, a new firm would make high profits if it could overcome the barriers. In long distance, regulation created an absolute barrier to entry until the 1970s. Prospective entrants knew they could make substantial profits if they were allowed to compete with AT&T, and they were willing to fight hard for the right.

159. The role of barriers to entry is prominent in all discussions of structural determinants of competition. If a small number of sellers are isolated from further competition by high barriers to entry, the likelihood of implicit collusion is higher. In my opinion, however, the barriers to entry in the long-distance business are relatively low, so actual and prospective entry keep the market competitive.

160. Potential barriers to entry in the long-distance industry include the cost of creating a network of sufficient size to compete effectively with existing carriers and the cost of attracting customers from those carriers. One form of entry would call for a completely new network of transmission facilities at the national level. This form would cost billions of dollars and

would likely be unprofitable. AT&T estimates that it has spent nearly \$3 billion on its fiber network excluding electronic or optoelectronic equipment.³⁹ It is precisely the favorable state of competition that makes such entry unprofitable. If the existing long-distance carriers were charging prices that generated excessive profits and were providing substandard service, the prospective profits to full-scale entry would be enough to induce the necessary large investment, exactly because there are no artificial barriers to entry in the long-distance market.

161. Most importantly, provision of national service does not require the ownership of a full national network. If uncompetitive behavior among the larger carriers created excessive prices, the resulting profit opportunity would be seized by operators who already know how to assemble an effective national service from components available today in the lease market.

162. Even if prevailing prices generated only moderate excess profits, a different form of entry at the national level could still occur. A national network could be created from a combination of investment and leasing of existing fiber capacity, a successful strategy pursued by WorldCom and Allnet. Also, entry is possible on a smaller scale by constructing a smaller network and by reselling the services of other carriers. AT&T has more than 50 percent of its fiber dark while Sprint has nearly a quarter still dark.⁴⁰ There is an active lease market for fiber transmission facilities to support this type of competition. Again, if failure of competition among the larger players created high prices and poor service, the smaller players would expand to take advantage of the profit opportunities that such a situation would create. The technology of long-distance telephone service is well suited to competitive discipline because successful rivals can remain permanently viable.

163. Professor MacAvoy, a believer that barriers to entry in long distance are virtually insurmountable, lists factors that will nonetheless make Ameritech a successful entrant to the Michigan long-distance market. One

³⁹ Jonathan Kraushaar, *Fiber Deployment Update*, Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission, April 1993..

⁴⁰ *ibid.*

factor is "its favorable contract with WorldCom for transport services."⁴¹ WorldCom, thanks in part to its acquisition of WilTel, a specialist in leasing bulk capacity, is happy to enter into bulk agreements with any customer. Ameritech's contract is conclusive rebuttal to the claim that there are barriers to entry.

164. Some economists have concluded that the basic transmission technology of modern long-distance service—fiber optics—has high fixed and low variable costs. In other words, according to this view, a long-distance carrier must make a large investment to be in business in the first place, but can then increase its volume of business without adding much capacity or incurring additional costs that rise with volume. But this view fails to consider the flexibility of long-distance operations. In particular, the ownership of facilities and the provision of long-distance service are not linked in the way that the analysis assumes. The United States has an active market in leased communications facilities that supports a much more flexible industry with essentially constant returns to scale. The market easily supports active competition among many long-distance carriers.

165. Analyses of barriers to entry have stressed the importance of sunk costs, rather than the total costs of entry. A sunk cost is one that cannot be recovered if entry is not successful. Few of the costs of transmission capacity in the long-distance business are sunk, because there is an active market where an unsuccessful entrant in retail long distance could sell or lease facilities to other retail sellers. In this respect, the long-distance market is quite different from the local market—in that market, the investment of an unsuccessful entrant may have little resale value, so sunk costs are a more important barrier to entry in local service than in long distance.

5. Profit

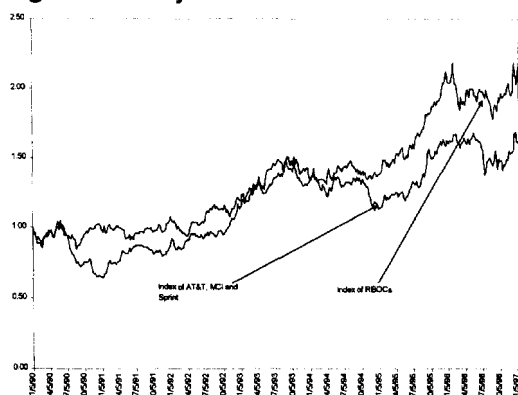
166. If existing long-distance carriers were charging prices that generated excessive profits and were providing substandard service, the profits of a prospective entrant would be enough to induce the necessary investment for full-scale entry because there are no artificial barriers to entry in the

⁴¹ *MacAvoy Affidavit*, p. 61.

long-distance market. Even if prevailing prices generated only moderate excess profits, a different form of entry at the national level, or entry on a regional level, could still occur. Today, 13 years after regulatory barriers to entry were removed, the entry of around 390 carriers of different sizes has exhausted the profits from entry. As a result, the long-distance market is substantially competitive, and the ease of entry ensures that the market will remain competitive in the future.

167. Where competition is weak, firms can overprice their products and enjoy abnormal profits from their market power. One way to consider profitability is to study data on stock market values. The market places a value on the future stream of profit. Figure 3 compares an index of AT&T, MCI, and Sprint adjusted stock prices to a similar index of adjusted stock prices for the Bell Operating Companies. The adjusted stock price is the value of an initial investment of \$1 with dividends continuously reinvested in the same stock. Each line in Figure 3 is the value-weighted average of the underlying individual stocks. The figure shows that, since the beginning of the decade, the Bells have outperformed AT&T, MCI, and Sprint in the stock market.⁴²

Figure 3. Adjusted Stock Prices for Long-Distance Carriers and Bells



168. Another way to see how the stock market views competition in the telephone industry is to compare stock-market values to the book values of

⁴² Data were compiled from TradeLine and represent monthly stock prices adjusted for capital changes and cash and non-cash dividends. An index, beginning 1/1/90, was constructed for each company. Then indices for the long-distance carriers and the RBOCs were constructed using market values as of January 20, 1997.

assets. Almost all firms trade well above book value, because of intangible assets not included in their accounts, but firms with market power are valued even higher because of the capital value of the extra profits associated with market power. Here are recent data on market to book value ratios for long-distance carriers and local telephone companies:

<i>Company</i>	<i>Ratio of Market to Book Value</i>
ATT	2.7
MCI	2.4
Sprint	1.8
WorldCom	8.0
Ameritech	4.4
Bell Atlantic	3.6
BellSouth	3.2
Nynex	3.0
Pacific Telesis	6.2
SBC	4.6
US West	4.3
SNET	5.3

Source: Morningstar StockTools Database

The only long-distance carrier with a lofty market value in relation to book value is WorldCom, not usually identified as a member of the comfortable long-distance oligopoly. AT&T, MCI, and Sprint—the usual members of that group—are at the bottom. The stars, apart from WorldCom, are Pacific Telesis and SNET.

169. If, as some economists have concluded, the long-distance industry earns abnormal profit from the market power that results from limited competition, then the profits of the established sellers should exceed the profits of the would-be rivals that are locked out of the market. A comparison of AT&T to WorldCom suggests just the opposite. The stock market value of AT&T is slightly over \$1 of value per dollar of revenue.

WorldCom commands over \$2 of value per dollar of revenue.⁴³ The stock market believes that AT&T's position is likely to continue to wither compared to other sellers such as WorldCom. AT&T's business is concentrated in traditional long-distance products, whereas WorldCom has found new specialties that the market considers more promising.

6. Returns to Scale

170. Competition cannot flourish in an industry where the technology has important returns to scale. When large scale brings lower cost, one firm will dominate and its cost advantage will prevent effective competition from smaller rivals. All the evidence suggests the absence of increasing returns in the long-distance market. AT&T is approximately three times as large as MCI. Under returns to scale, AT&T should have substantially lower costs per minute of service and thus higher profits. But, in fact, AT&T and MCI are about equally profitable. Further, many carriers exist in the market that are much smaller than MCI, and these small carriers are not only viable, but profitable and growing.

I. Conclusion on Competition and Collusion

171. The United States has a vibrant, successful long-distance industry. Since competition was introduced to the long-distance market, there has been a large and continuing flow of technological innovations. The performance of the industry in the past decade has been a clear success, with substantial declines in prices relative to other products and the rapid development and dissemination of advanced technologies by the competitive long-distance carriers. The price-cost margin has declined to close to its competitive minimum.

172. The force of competition among the four major long-distance carriers (AT&T, WorldCom, MCI, and Sprint) and dozens of other significant carriers has pushed prices down to the level where only an efficient firm with perceptive management can make a profit. But competition in long distance does not take the precise form of textbook perfect competition. For example, AT&T's brand name and consumer inertia dating back to the time when the

⁴³ Morningstar StockTools Database.

company was a monopoly gives a continuing, though declining, advantage to AT&T.

173. After divestiture provided the opportunity for full competition in the long-distance market in the United States, competition acted quickly to lower prices. Increasing competition and rising productivity were driving forces, along with declining access charges, in lowering long-distance prices. The decline in the price of long distance was most rapid just after divestiture, but has continued since 1987. The economic analysis of the benefits of competition teaches that competition will drive prices toward the level of cost. During the transition from noncompetitive prices to competitive prices, large price reductions will occur. After the benefits of competition are achieved, the economy continues to enjoy low prices but cannot expect prices to continue falling at their earlier rate. Future declines in long-distance prices will come from continuing improvements in productivity and from any further declines in access charges that are granted by regulators or that result from structural changes in local telephone service.

174. In my opinion, the performance of the industry suggests vigorous competition with large consumer benefits even though AT&T still has about half of the U.S. long-distance market. There are neither natural barriers to entry nor barriers created by law in the market. If competition were inadequate, new firms would enter and those currently on the periphery would move into the core.

175. Professor MacAvoy concludes that the long-distance industry is distinctly non-competitive. The particular form of non-competitive organization that he diagnoses is tacit collusion. In his view, each long-distance carrier is willing to stick to high prices because there is an understanding that the others will keep their prices high as well. However, Professor MacAvoy cites no evidence of actual collusion. His diagnosis of tacit collusion makes little sense for an industry with numerous sellers, many of whom are small enough to avoid any strategic response from the four major sellers, but collectively large enough to exploit any gap between price and cost. As he notes, these sellers—currently ranked number 5 and

smaller—have grown collectively in recent years and now account for an important share of the total market.⁴⁴

J. Ameritech's Possible Role in Increasing Competition in the Michigan Long-Distance Market

176. A major issue in evaluating Ameritech's proposal is the current performance of the long-distance industry. My conclusion, stated above, is that the performance of the industry has been outstanding since competition became effective. Although the long-distance industry does not entirely fit the model of textbook perfect competition, long-distance customers have enjoyed sharply declining prices and improved service, and the market satisfies the standard of highly workable competition.

177. In view of the absence of barriers to entry and the absence of abnormal profit in the industry, there simply is no important market power left for Ameritech to compete away. Since divestiture, the entry of numerous sellers has competed away the profit opportunities that previously existed.

178. As a result, standard economic analysis concludes that Ameritech's control of a long-distance carrier in the Michigan market would not increase the number of long-distance carriers in that market in the long run. Entry is driven by potential profit, and industry equilibrium occurs at the point where there are sufficiently many sellers so that the incremental profit to one more seller is zero. The number of sellers is determined by this condition. Consequently, if Ameritech enters a particular market, it means that there will be one fewer other seller in the market in equilibrium. Price and quantity are the same whether the equilibrium includes Ameritech or not.

⁴⁴ *MacAvoy Affidavit*, p. 11.

V. Evaluation of Ameritech's Proposed Control of a Long-Distance Carrier

179. My analysis of the impact of Ameritech's control of a long-distance carrier relies on the analysis and factual conclusions presented earlier in this affidavit. There are two major issues: (1) the benefits to the consumer from Ameritech's possible role in increasing competition in the Michigan long-distance market, and (2) the harm that would result from the breakdown in cooperation in the telephone system as a result of Ameritech's dominant position in providing access services. Part IV provided the basis for my conclusion that the long-distance consumer has little to gain from the addition of Ameritech to the long list of sellers already present in the Michigan long-distance market. Part II discussed Ameritech's dominance of the Michigan access market and the limited role that local telephone competition is likely to play in the next few years in constraining Ameritech's conduct with respect to its long-distance rivals. Material in Part III provided the analytical framework and factual background for my conclusion that Ameritech's presence in the Michigan long-distance market is a threat to consumer welfare in that market.

180. As I noted in Part III, the purpose of the existing policy of structural separation is to ensure cooperation between the local carriers such as Ameritech and the downstream long-distance carriers, who are dependent on the local carriers. One reason for changing the policy might be that the need for cooperation has declined. But trends in telecommunications appear to be sharply in the opposite direction. As the telephone network becomes more sophisticated, the amount of technical information about the local network and interaction between the local network and the long-distance carrier is becoming greater. To put it differently, the consequences to a long-distance carrier of lack of cooperation from a local carrier are greater today than in 1982 when the decision to impose structural separation was made. As soon as a local carrier such as Ameritech controls a long-distance carrier, the local carrier will owe its shareholders a duty of non-cooperation with its rivals in long distance. Competing with rivals, not helping them, is a central principle of the American economy.

181. The premise that vertical integration is a danger to the long-distance consumer is embodied in the Telecommunications Act of 1996, which requires that local competition reach a threshold level before a local carrier is permitted to control a long-distance carrier. As I concluded in Part II local competition in Michigan is far short of that threshold. Except for large businesses, few telephone customers can turn to alternative sellers of access services to avoid the adverse effects of Ameritech's withdrawal of cooperation once it controls its own long-distance carrier.

182. Both the actual experience with local telephone companies' activities in long distance and local toll and an analysis of the structure and performance of the existing long-distance market agree that the consumer has almost nothing to gain from a local telephone company's control of a long-distance carrier. In both local toll and long distance, local phone companies are the high-price sellers.

VI. Discussion of Analyses Performed by Ameritech's Experts

A. Issues in the Measurement of Prices

183. Ameritech's experts ignore the reality of how long-distance is priced today. After reading the affidavits by Professor MacAvoy and Dr. Crandall and Professor Waverman, one is left with the impression that most purchasers of long-distance pay the standard prices. One is also left with the impression that only selected customers pay lower rates using low-price plans. Nothing could be further from the truth.

184. As I discussed earlier, 80 percent of MCI's residential customers purchase long distance using a discount plan. Of the remaining 20 percent, about a quarter do not even purchase long distance in a given month and nearly 50 percent purchase less than \$3. Professor MacAvoy states that 62

percent of MCI's customers are not on discount plans, based on PNR data.⁴⁵ The evidence shows, however, that the PNR data are severely biased.

185. PNR wrote to 25,000 households requesting copies of their local telephone bills, long-distance bills, cable TV bills, and cellular bills.⁴⁶ PNR paid \$5 to each responding household. The effort yielded telephone bills from 8,731 households, for a response rate of about 35 percent.⁴⁷ Whenever a survey is performed, an analysis of non-respondents must be done to insure that the respondents are not biased, particularly when the response rate is this low.

186. The bias from selective response appears to be serious. MCI has carried out a comparison of data from PNR on purchases from MCI with similar data on purchases by all of MCI's customers. According to PNR, about 54 percent of MCI residential customers spent \$10 or less on long distance. In the MCI data, the corresponding fraction is only 32. Plainly, the highest usage customers were under-represented in the sample. MCI's data suggests that Professor MacAvoy's estimate that 62 percent of telephone customers pay standard long-distance rates is a serious overstatement.

187. Thus Ameritech's experts appear to be quite incorrect in their claim that most long-distance customers pay standard rates. In fact, the great majority use lower-price plans. The low-volume user is not neglected: all four of the largest carriers offer flat rate plans that have no minimum with rates lower than the average rates quoted by Professor MacAvoy and Dr. Crandall and Professor Waverman.⁴⁸ Because Professor MacAvoy and Dr. Crandall and Professor Waverman generally ignore these pricing plans, they fail to observe the dramatic reduction in prices over the last decade price declines that have continued through the last few years.

⁴⁵ *MacAvoy Affidavit*, p. 47.

⁴⁶ PNR and Associates provided MCI with promotional documents for a program known as Bill Harvest II. The discussion in this paragraph and the next are based on these documents.

⁴⁷ *Ibid.*, PNR information about Bill Harvesting II.

⁴⁸ WorldCom's plan has different rates for peak and off-peak calls.

188. As Dr. Crandall and Professor MacAvoy point out, standard rates offer little variety.⁴⁹ Discount plans are just the opposite. According to Fone Saver's Web site (WWW.WP.COM/Fone_Saver/ld.html), there are hundreds of plans available for residential phone use. Each of the carriers has a Web site to present its offerings. There are plans to offer discounts that are specific to a customer's calling patterns. There are also services, such as Fone Saver, that will analyze your bill and determine your best plan. Newspapers and magazines frequently run articles summarizing the best plans available. For example, see the article in the *Wall Street Journal* quoted in Part IV, Section B.

189. Reading Ameritech's experts' affidavits, one is left with the impression that discounts in the long-distance business are like discounts at a tire store. The great majority of shoppers pay the quoted price at the tire store, but the occasional pushy shopper gets a 10 percent discount. This is precisely the way that Dr. Crandall and Professor Waverman approach the subject.⁵⁰ Their analysis of long-distance prices is based on the higher standard rates (Figures 4 through 7). As an afterthought, they consider the possibility of a 10 percent discount available uniformly in all years. This is a dreamland. In fact, revenue per minute in 1996 was 14.5 cents, far below the standard rate of around 23 cents. And the flat rate of 12 cents currently available from MCI is even better.⁵¹

190. Although the main focus of the marketing of long-distance services is now on simple flat rates, some carriers such as AT&T do offer plans that are stated as discounts off the standard rate. But the discounts are anything but stable over time. For example, prior to becoming an MCI One customer recently, I received a 40 percent discount off AT&T's standard rates for all my long-distance calls, with no fee and no minimum. No discount of this magnitude was available in earlier years. I currently receive a 50 percent discount off AT&T's standard rates for credit-card calls.

⁴⁹ *Crandall-Waverman Affidavit*, p. 26.

⁵⁰ *Crandall-Waverman Affidavit*, p. 27.

⁵¹ For callers with total bills exceeding \$25. MCI also has a flat rate plan of \$.145 per minute for low-volume customers.

191. These results confirm the importance of low-price plans in evaluating the performance of the long-distance market. Ameritech's experts are oblivious to the structure of long-distance pricing. Much of their analysis deals with standard rates, particularly when they discuss how prices change over time.⁵² Were this the case, and were the percentage discounts stable, then actual prices paid would track changes in standard rates. Actual prices would have risen in the past few years. But reality is just the opposite. As the sharp decline in revenue per minute shows, actual prices have been declining in the last few years, just as they did in earlier years. The percentage difference between standard rates and bargain flat rates has risen dramatically and is continuing to rise.

B. Price Changes in Response to Access Charge Changes

192. Both Professor MacAvoy and Dr. Crandall and Professor Waverman review how prices have changed as access prices have changed. They conclude, contrary to the FCC,⁵³ that carriers have failed to pass on the access price savings to their customers. Their contrary conclusion is the result of two critical mistakes in their analyses: (1) relying on price measures that fail to capture most of the declines in long-distance prices that have occurred since 1984; and (2) the use of a totally inappropriate benchmark to measure the relation between prices and access charges.

1. Price Measurement

193. Professor MacAvoy's analysis of the price-cost margin relies primarily on higher standard rates to measure prices. These rates move quite differently from the low rates that account for a substantial and important part of the actual price declines in the long-distance industry. The problem with his price data is immediately apparent in Figures One through Eight in his affidavit.⁵⁴ The 1996 prices he calculates for switched long-distance service are in the range of 22 to 28 cents per minute, essentially at the

⁵² *MacAvoy Affidavit*, pp. 21-26 and *Crandall-Waverman Affidavit*, pp. 26-32.

⁵³ *In the Matter of Price Cap Performance Review*, CC Docket No. 94-1 for Local Exchange Carriers Access Charge Reform CC Docket N. 96-262, May 7 1997, paragraph 185.

⁵⁴ *MacAvoy Affidavit*, p. 23-27.

higher standard rates set by the three carriers he considers. It is impossible for all long-distance customers to be paying prices in this range and for revenue per minute to be only 14.5 cents.

194. Professor MacAvoy is plainly aware of his overstatement of long-distance prices. In his calculation of the effect of Ameritech's presence in the Michigan long-distance market, he uses 15 cents per minute—AT&T's flat rate—as a measure of the price before entry.⁵⁵ This price is almost exactly equal to revenue per minute. He has the good sense in the later analysis to discard his erroneous high calculated prices and to use a price very close to revenue per minute.

a) *Professor MacAvoy's Criticisms of the Use of Revenue per Minute to Measure Long-Distance Prices*

195. As I noted earlier in this affidavit, I believe that the best available measure of the price of long-distance service is the revenue per minute earned by long-distance carriers. The primary reason is that customers have enjoyed large price reductions by switching from standard rates to plans with much lower rates. Professor MacAvoy makes two main criticisms of the use of revenue per minute to summarize trends in long-distance prices: (a) Carriers presumably charge what is specified in their price plans, so to figure out the cost of a call, one should look at the plans; (b) revenue per minute does not control for changes in the mix of calls by distance, time of day, or length.⁵⁶

196. Except for billing errors, customers pay what carriers have specified in the plan selected by the customer. But carriers change these plans continuously. I pointed out earlier that one seller can take business away from a rival by catching the rival by surprise. These surprises occur all the time. I became an AT&T subscriber by receiving a check for \$100 in the mail which, upon negotiation, entitled me to receive service from AT&T at 40 percent off its standard rates. A glance at Professor MacAvoy's price calculations shows that he has not captured the bargains that are available. The task of sifting through all the price plans available each month,

⁵⁵ *MacAvoy Affidavit*, p. 68.

⁵⁶ *MacAvoy Affidavit*, p. A-12.

determining what fraction of customers will choose each plan, and then calculating the average price is impossibly complex. It is completely clear from the high level of Professor MacAvoy's calculated prices that he has failed to approximate the proper calculation.

197. On the other hand, revenue per minute automatically considers the current mix of customers across price plans. When MCI offers a flat rate of 12 cents and many of its customers save money by switching to that rate, MCI's revenue per minute accurately reflects the decline in what the public is paying for long distance.

198. Professor MacAvoy believes that long-distance service sold through standard rates is a different product from service sold through lower flat rates. He argues that large customer shifts to discount plans must lead to decreases in revenue per minute even though standard and discount plan prices remain unchanged.⁵⁷ In other words, the price index for long-distance service should exclude the improvements that the public has enjoyed by being able to purchase long distance at lower prices through more attractive price plans. Under Professor MacAvoy's view, if every carrier announced new flat rate plans at a penny a minute, and all customers switched to the new plans, the proper price for the analysis of price-cost margins would still be his 23 cents, derived from irrelevant unused standard rates. Professor MacAvoy recognizes that consumers benefit from switching to lower-price plans⁵⁸, but does not believe that the resulting lower price is the result of increased competitiveness. I believe it is fair to say that his view would be accepted by few other economists, who would see the move to buying the same product at a lower price as an increase in competitiveness beneficial to the consumer.

199. Professor MacAvoy does consider an alternate calculation based on lower price plans. He appears to consider only two plans for MCI, Prime Time and Any Time, the two he claims to be most popular (he does not consider the flat rate MCI One plan that is now a main focus of MCI's offerings). The Any Time Plan is no longer even a featured plan. Professor

⁵⁷ *MacAvoy Affidavit*, p. A-13.

⁵⁸ *MacAvoy Affidavit*, p. A-13, paragraph 19.

MacAvoy ascribes a price per minute of \$.145 for MCI when MCI's central product is a flat \$.12 rate.⁵⁹

200. Professor MacAvoy's calculations appear to overstate prices even for customers paying standard rates. For example, in his calculations the standard rate paid by a residential customer is about \$.23. Yet, according to MCI internal documents, for MCI customers paying standard rates, the average rate per minute is \$.18. Apparently Professor MacAvoy has failed to calculate his prices using the proper mix of time of day and mileage band calls for these customers.

201. Professor MacAvoy's second concern about using revenue per minute is that mix effects will distort the calculation. A mix effect would distort revenue per minute if the composition of long-distance sales shifted toward products that are cheaper to produce, such as calls at night. The mix effects that Professor MacAvoy fears are tiny in comparison to the error made by using list prices in place of actual prices. Today, the standard prices of long distance do not depend on the length of the call at all and are insensitive to distance—AT&T's standard evening rate from California to New York is 17 cents per minute and from Chicago to Detroit is 16 cents per minute, for example. The only mix effect that is at all likely to matter would be between day and night calls. In order to explain the dramatic decline in revenue per minute as a mix effect, there would have had to have been a tremendous shift from daytime to nighttime calls. There is no evidence that this has happened. Rather revenue per minute has fallen so much in relation to standard rates because the use of low flat rates and other cheaper price plans is more widespread.

b) Dr. Crandall's and Professor Waverman's Criticisms of the Use of Revenue per Minute to Measure Long-Distance Prices

202. Dr. Crandall and Professor Waverman make the same mistake as Professor MacAvoy in relying on standard prices to compute price changes. Moreover, their discussion of discount plans, as discussed earlier, restricted to a 10 percent discount plan that remains unchanged over time. They then

⁵⁹ MacAvoy Affidavit, p. A-29.

go on to criticize my use of revenue per minute in a number of ways that I believe are incorrect.

203. First, they state that my findings of declining long-distance prices are misleading because of the inclusion of international calls. In fact, these calls are excluded in my work. My data include information only on domestic interLATA calls. I excluded international calls because, as Dr. Crandall and Professor Waverman note, the decline in price may be due to causes other than increased competition in the United States.

204. Dr. Crandall and Professor Waverman realize that the FCC study by Jim Lande, discussed earlier in this affidavit, support my calculations. They then criticize my results (as well as his) on the grounds that my data are inconsistent with annual reports filed with the Securities and Exchange Commission. First, they have inaccurately transcribed the data for AT&T for 1995 and for MCI, thereby understating the weighted average price for the three major carriers. Second, the data in the annual reports include all international calls. These data in the annual reports also include dedicated, international inbound and other non-minute calls that are not included in my data. I reconciled the differences for MCI using confidential MCI data. I found that my data accurately reflect the price per minute.

2. Assessing Carriers' Response to Changes in Access Prices

205. Professor MacAvoy's and Dr. Crandall and Professor Waverman's errors in measuring prices cause them to reach erroneous conclusions about the response of prices to changes in access charges. Professor MacAvoy asserts that "Thus, ARPM fell more slowly than the corresponding decrease in access costs, which would indicate that markets were becoming less competitive."⁶⁰ Dr. Crandall and Professor Waverman assert that reductions in access prices have not been passed on to the consumer because "interstate revenues have grown much more rapidly than have access charges."⁶¹

⁶⁰ *MacAvoy Affidavit*, p. A-16.

⁶¹ *Crandall-Waverman Affidavit*, p. 35.

206. Dr. Crandall and Professor Waverman conclude the Common Carrier Bureau's *Industry Analysis Revenues Report*, which shows interstate revenues per minute falling twice as rapidly as access charges, must be in error because it differs from data collected by the Census Bureau. The *Annual Survey of Communication Services* reports an increase of 27.8 percent but an increase only of 14.7 percent for access charge revenue.

207. First, there are other types of revenues, such as private line and international revenues that distort the percentage changes for interstate switched revenues. Lande is careful to use only interstate switched revenues. Other differences between the Census data and the data used by Jim Lande are discussed in the *Telecommunications Industry Revenue: TRS Fund Worksheet Data*.⁶² In addition, I have discussed the discrepancy in access charge revenues with both the Census Bureau and the Common Carrier Bureau. The consensus is the differences most likely arise because the Census is taking a sample and that it is not verifying reseller data to insure that the data are properly recorded. In contrast, the FCC requires all companies to report and monitors how the data are reported.

208. More importantly, Dr. Crandall and Professor Waverman make a fundamental error in interpreting the data.⁶³ Census data report that interstate revenues have twice the growth rate of interstate access revenues. They conclude that interstate revenues per minute must have increased more rapidly than have access rates per minute. But a simple calculation using an increase in traffic of 41 percent from 1990 to 1995, based on the percent increase in switched access minutes of use, and a decline of 29 percent in access charges per minute lead to results confirming the data shown earlier in Section IV C.

209. Professor MacAvoy makes the same error.⁶⁴ The absurdity of this error can be seen from the following example. Assume a firm produces bargain toys for \$1.00, and it sells them for \$1.01. The tag on the toy costs \$.02.

⁶² *Telecommunications Industry Revenue: TRS Fund Worksheet Data*, Jim Lande, Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission, December 1996, p. 5.

⁶³ *Crandall-Waverman Affidavit*, p. 35.

⁶⁴ *MacAvoy Affidavit*, Appendix A., p. A-16.

The firm finds a new source that for tags at \$.01. In response to this price reduction, the firm now sells its toys for \$1.00. Its price reduction is about 1 percent in response to a cost reduction of 50 percent. Professor MacAvoy and Dr. Crandall and Professor Waverman would conclude that the manufacturer had failed to reduce its selling price in response to a reduction in manufacturing costs because the selling price reduction is only 1 percent in contrast to a reduction of 50 percent in the cost of tags.

210. Professor MacAvoy makes another puzzling calculation. He asserts, in the appendix to his affidavit, that competitiveness can be assessed from the margin of price over the access charge. This is fallacious. Competitiveness can be assessed by looking at the margin of price over marginal cost, including all elements of cost, not by looking at the margin of price over one component of cost. Again, to return to the bargain toy example, the firm's margin would have increased from 98 percent to 99 percent following the cost reduction. Professor MacAvoy would conclude that the firm was in an uncompetitive industry which failed to pass cost reductions onto the consumer.

211. The only way to determine if reductions in access prices have been past on to the consumer is to see if price has fallen at least as much as access prices have. That is exactly what I did in Section IV C, and this is exactly what the Common Carrier Bureau did in their *Industry Revenue Report*. We both reached the same conclusion: prices have fallen more than access charges have fallen.

C. Profit Margins Earned by Long-Distance Carriers

212. In his affidavit, Professor MacAvoy analyzes the price-cost margin for long distance during the last decade and finds that the margin has risen.⁶⁵ But, as he recognizes, this result runs contrary to what standard economic principles would dictate during a period when market concentration was actually falling. Rather than determine the source of this paradox, Professor MacAvoy takes the finding literally and ultimately reaches absurd conclusions from it (see VI D below, "Evidence about the Extent of

⁶⁵ *MacAvoy Affidavit*, p. 36.